

# Climate Change



# Global Warming

- A warming trend caused by unnatural changes in the atmosphere.
  - Weather extremes: heat waves, hurricanes, droughts, floods.
  - Burning fossil fuels is a major cause of global warming.

**There is scientific consensus that global warming is real, is caused by human activities, and presents serious challenges.**



Global warming is caused by these

## **Greenhouse Gases**

building up and trapping heat in the Earth's atmosphere;

1. **Carbon dioxide**: from burning coal, oil and gas in power plants, cars, factories, etc.
2. **Methane**: released from rice paddies, both ends of cows, rotting garbage in landfills, mining operations, and gas pipelines.
3. **Chlorofluorocarbons** (**CFCs**: also causing ozone depletion)
4. **Nitrous oxide**: from fertilizers and chemicals.



Earth's average temperature has risen about 1 degree F in the past 100 years and will rise another 3 to 10 degrees F in the next 100 years

- Ex. Summer heat waves in the Great Lakes region have already had pollution episodes and increased health risks (breathing problems).
- Regions near the Arctic Ocean and Hudson Bay are expected to have much warmer winters (glaciers melting) but the Atlantic regions will change very little.



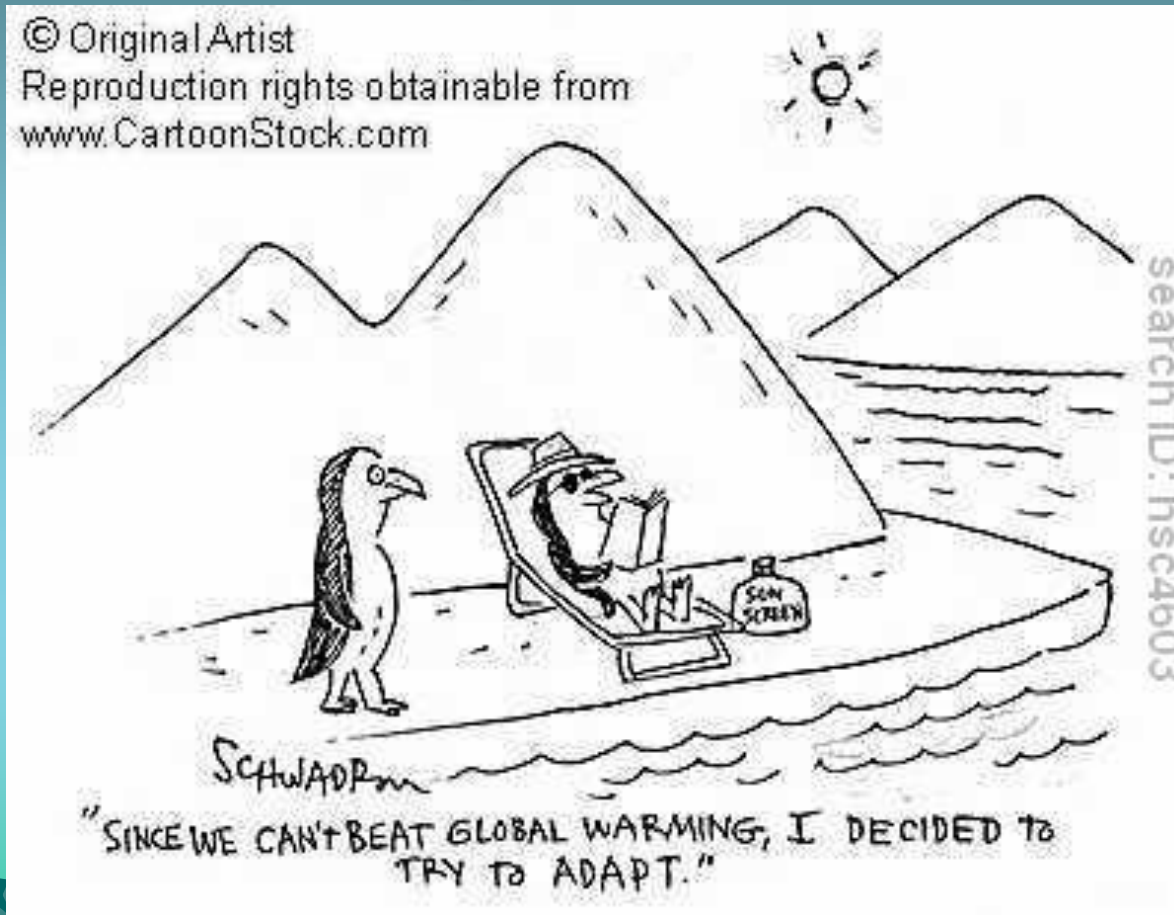
Global warming will have significant impacts on people and nature.

As temperatures continue to rise, precipitation will become more frequent in heavy downpours.

We can expect extreme wet and dry conditions.



# Plant and animal species will migrate or disappear in response to changes in climate



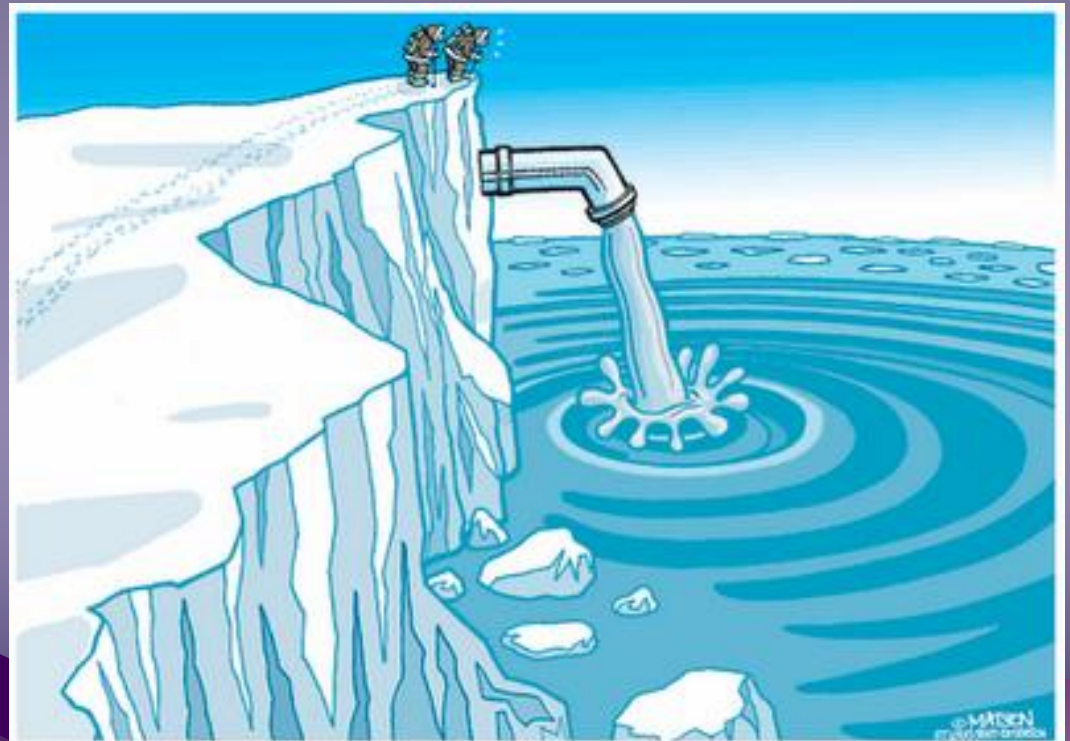
Sea level has already risen due to warming and is projected to rise much more.

Many people are under the mistaken impression that only if the polar ice caps melt will sea level rise.

The melting ice caps is one reason but the main reason

is because

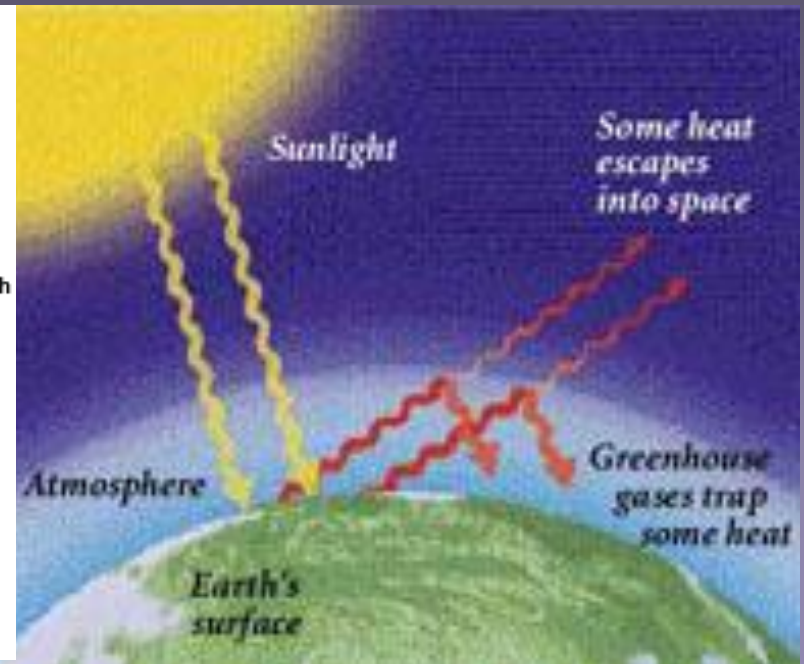
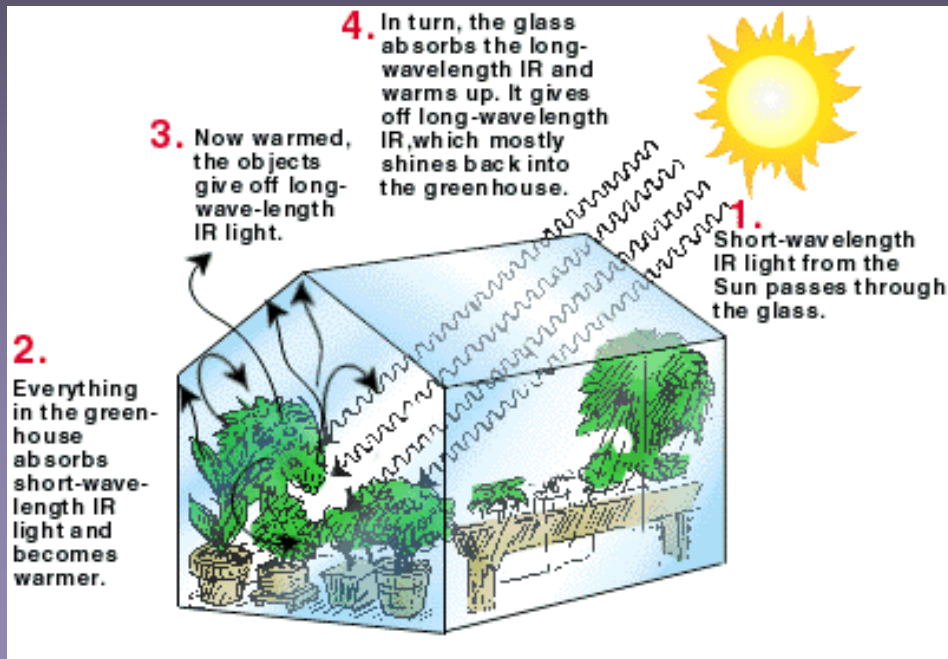
water expands  
as it warms.



"HOW ON EARTH DO WE TURN IT OFF?"

MATTEN  
caglecartoons.com

# Greenhouse Effect



1. Shortwave sunlight enters the atmosphere.
2. Energy is absorbed by the ground and is re-radiated as heat or longwave radiation.
3. Heat is captured by greenhouse gases and kept in the atmosphere.

# The ozone hole does not cause global warming

Ozone depletion is a different problem caused mainly by CFCs



- The ozone layer is only just beginning to recover, partly because these chemicals remain in the atmosphere for a long time.

- Humans are able to live on Earth because of a similar effect to the Greenhouse Effect
- If clouds, water vapour and gases (**Greenhouse Gases**) didn't absorb and hold the sun's heat, Earth would be too hot during the day and very cold at night
- However, all these gases building up are trapping too much heat close to Earth resulting in Global climate change.



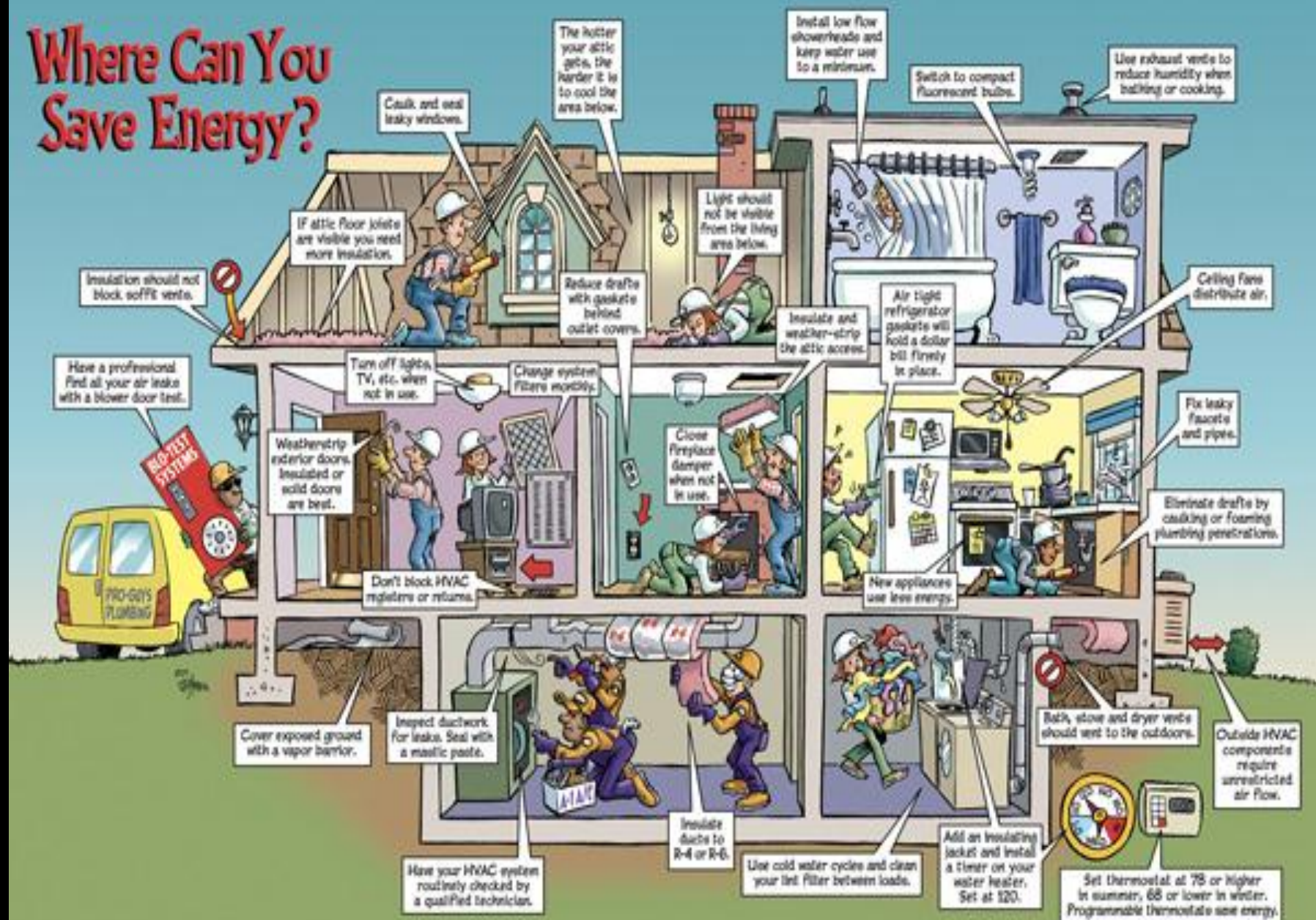
- Saving energy and developing alternative energy sources would help.

BUT even if we take aggressive action now, we can't completely prevent climate change because once carbon dioxide is in the atmosphere, it remains there for about 120 years

BUT we need to think of our future generations!!



# Where Can You Save Energy?



# SAVE ENERGY

THIS  
MEANS  
YOU!

